

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>AS/AM/P13151PC</b>	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. <b>PCT/GB2004/004840</b>	International filing date (day/month/year) <b>17/11/2004</b>	(Earliest) Priority Date (day/month/year) <b>17/11/2003</b>
Applicant <b>CHURCHILL DRILLING TOOLS LIMITED</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (See Box II).

3. ☐ Unity of invention is lacking (see Box III).

## 4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

## 5. With regard to the abstract,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

## 6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 1a

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

- b. ☐ none of the figures is to be published with the abstract.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB2004/004840

## Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

A downhole tool (10) comprises a body (12) adapted to be incorporated in a drill string. The body defines a bore (20) and having a valve arrangement including a flow port (18) in the wall of the body and a valve element (22) biased towards a position to open the port. The valve element is initially retained in a position to close the flow port (18) but can be released as required to allow the flow port to be opened. The tool may be utilized as a bypass sub or a dump sub. For use as a bypass sub, the body bore below the flow port may be closed or restricted.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB2004/004840

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 E21B21/10

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 298 077 A (EMERY ET AL) 3 November 1981 (1981-11-03)	1, 48, 65
A	column 3, line 52 - line 66; figures	64
A	US 6 349 763 B1 (ESTEP JAMES W ET AL) 26 February 2002 (2002-02-26)	1
A	abstract; figures	
A	US 5 873 414 A (VON GYNZ-REKOWSKI ET AL) 23 February 1999 (1999-02-23)	1
A	abstract; figures	
A	US 4 889 199 A (LEE ET AL) 26 December 1989 (1989-12-26)	1
A	abstract; figures	

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the International filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the International filing date but later than the priority date claimed

\*T\* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*G\* document member of the same patent family

Date of the actual completion of the international search

3 March 2005

Date of mailing of the international search report

14/03/2005

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International Application No

PCT/GB2004/004840

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4298077	A	03-11-1981	NONE	
US 6349763	B1	26-02-2002	CA 2376443 A1	01-03-2001
			EP 1214496 A1	19-06-2002
			NO 20020808 A	19-04-2002
			WO 0114685 A1	01-03-2001
			US 2002005299 A1	17-01-2002
US 5873414	A	23-02-1999	AU 9299298 A	22-03-1999
			EP 1019611 A1	19-07-2000
			NO 20001118 A	11-04-2000
			WO 9911903 A1	11-03-1999
US 4889199	A	26-12-1989	US 5499687 A	19-03-1996